

US EPA RECORDS CENTER REGION 5



467839

Fields Brook Action Group

October 11, 2005

DNAPL Presentation

How DNAPL Flows in the Subsurface



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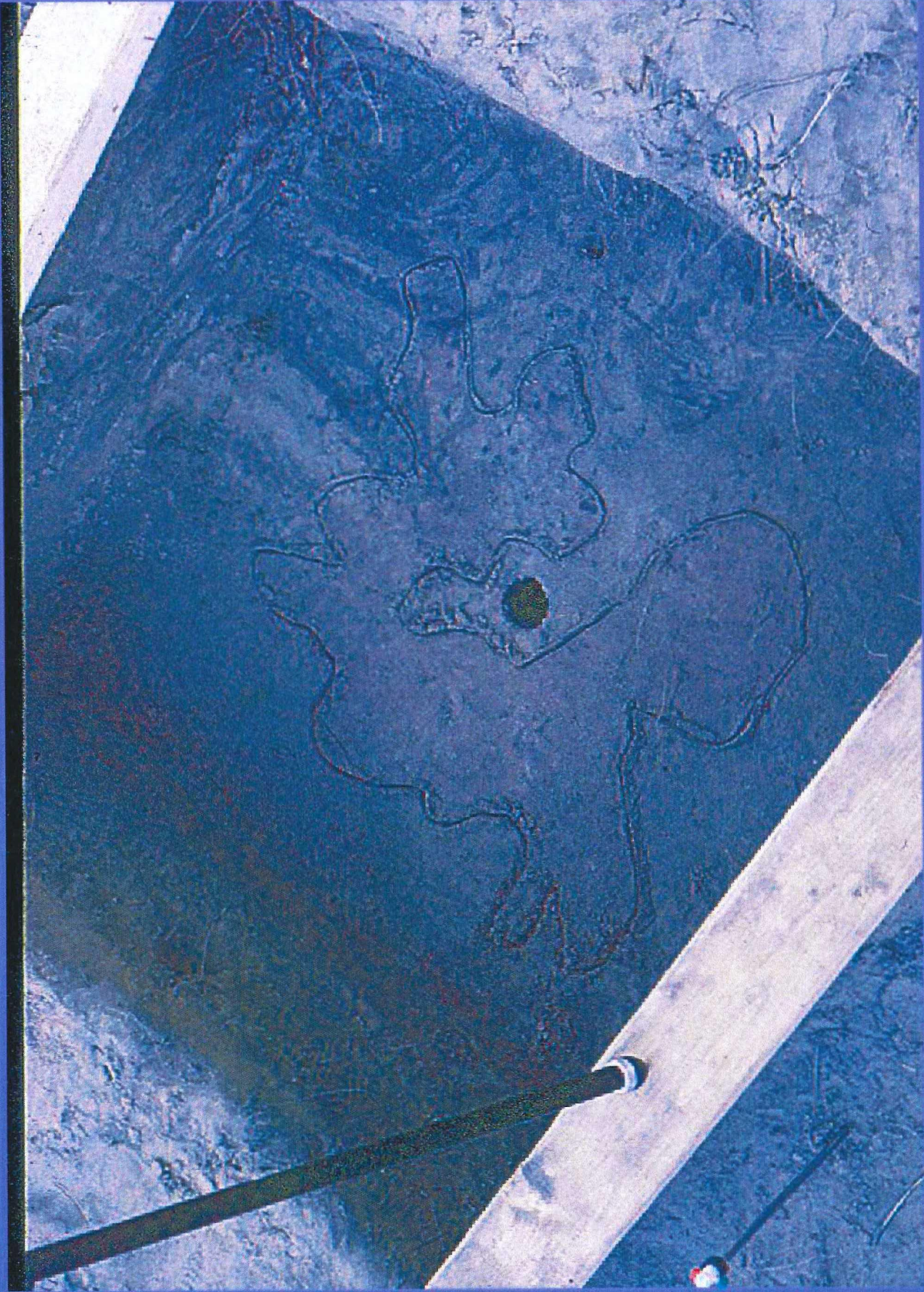




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The remainder of this Presentation contains no additional information that is not included in the Report of 2005 DNAPL Investigation that was submitted to USEPA on September 30, 2005.

2005 Contamination Source Identification and Delineation Study

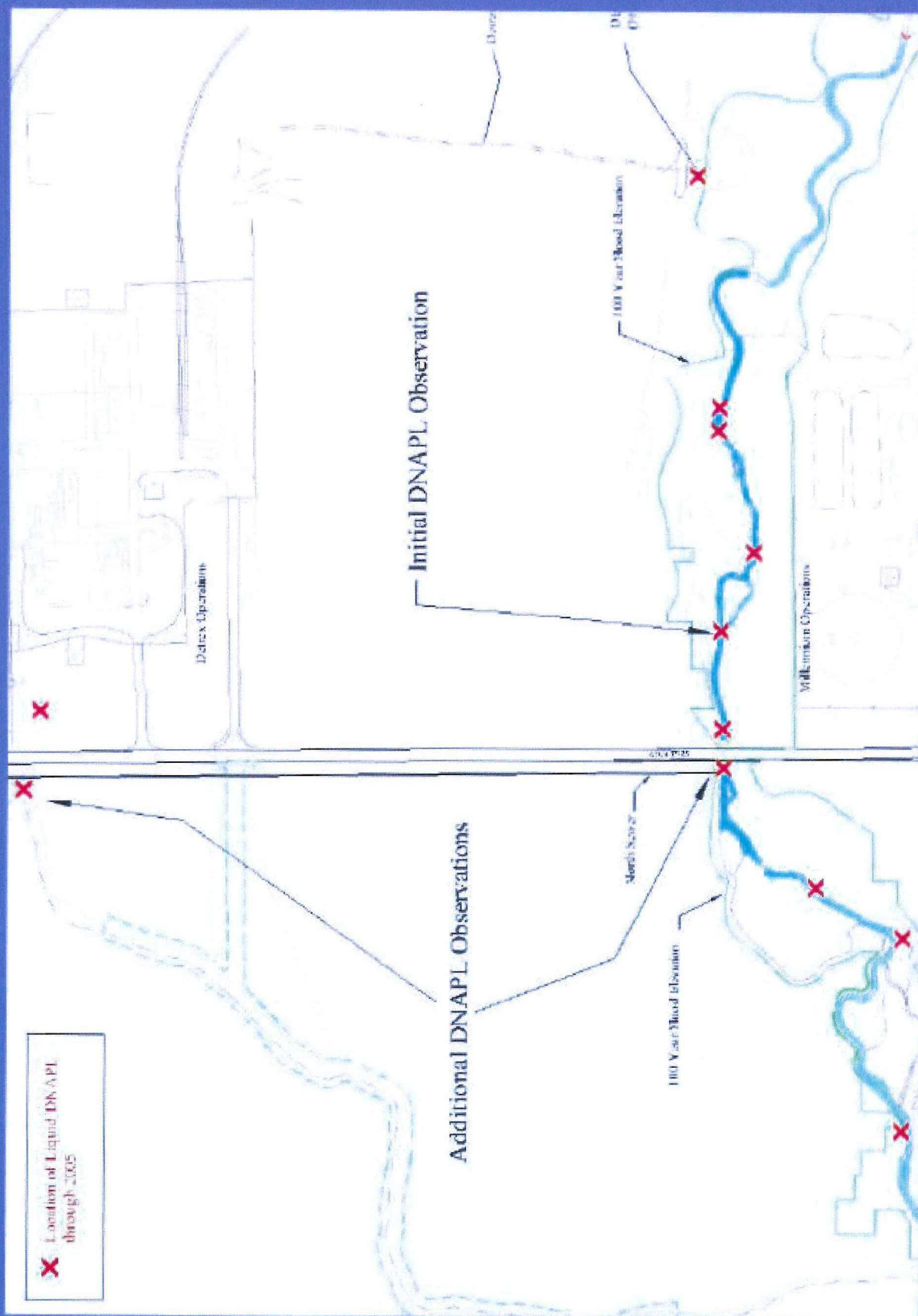
- Following Discovery:
 - Notified USEPA and OEPA
 - Developed a plan to assess the DNAPL
 - Contain the DNAPL to the industrial areas
 - Determine the source
 - Report the findings

What elements were included in the investigation?

- Review of Historical Documents;
- Geoprobe[®] Borings;
- Field Screening (PID);
- DNAPL and Soil Sampling;
- Independent Evaluations by Experts;

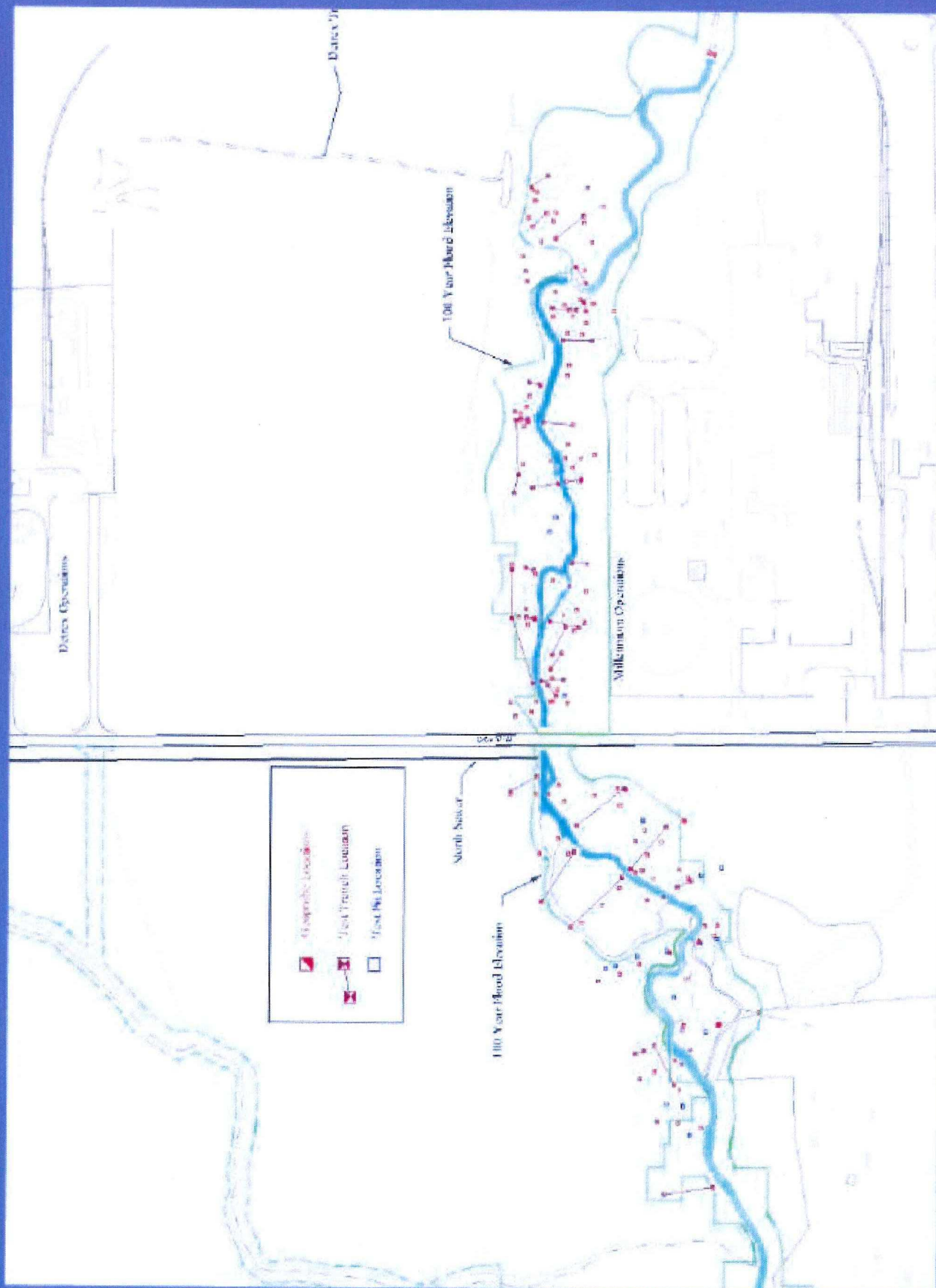
2005 DNAPL Findings

- 10 Locations of pooled DNAPL in EUs 8, 6 and 5, including
- Surficial pooled DNAPL at the base of the North Sewer and EU5 (as it crosses State Road)
- Chemically consistent DNAPL with the 2001 material



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Figure 1

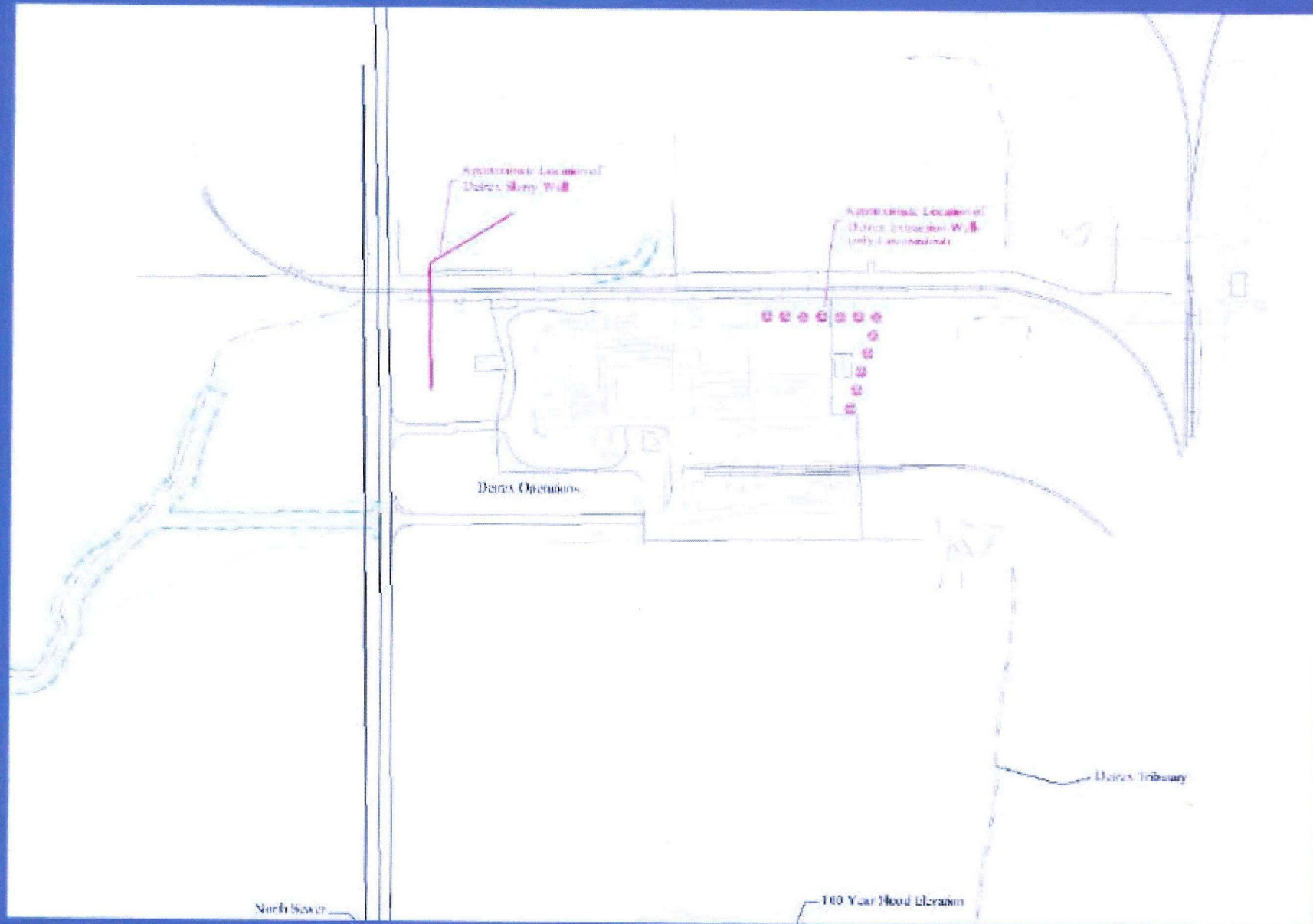


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Figure 3

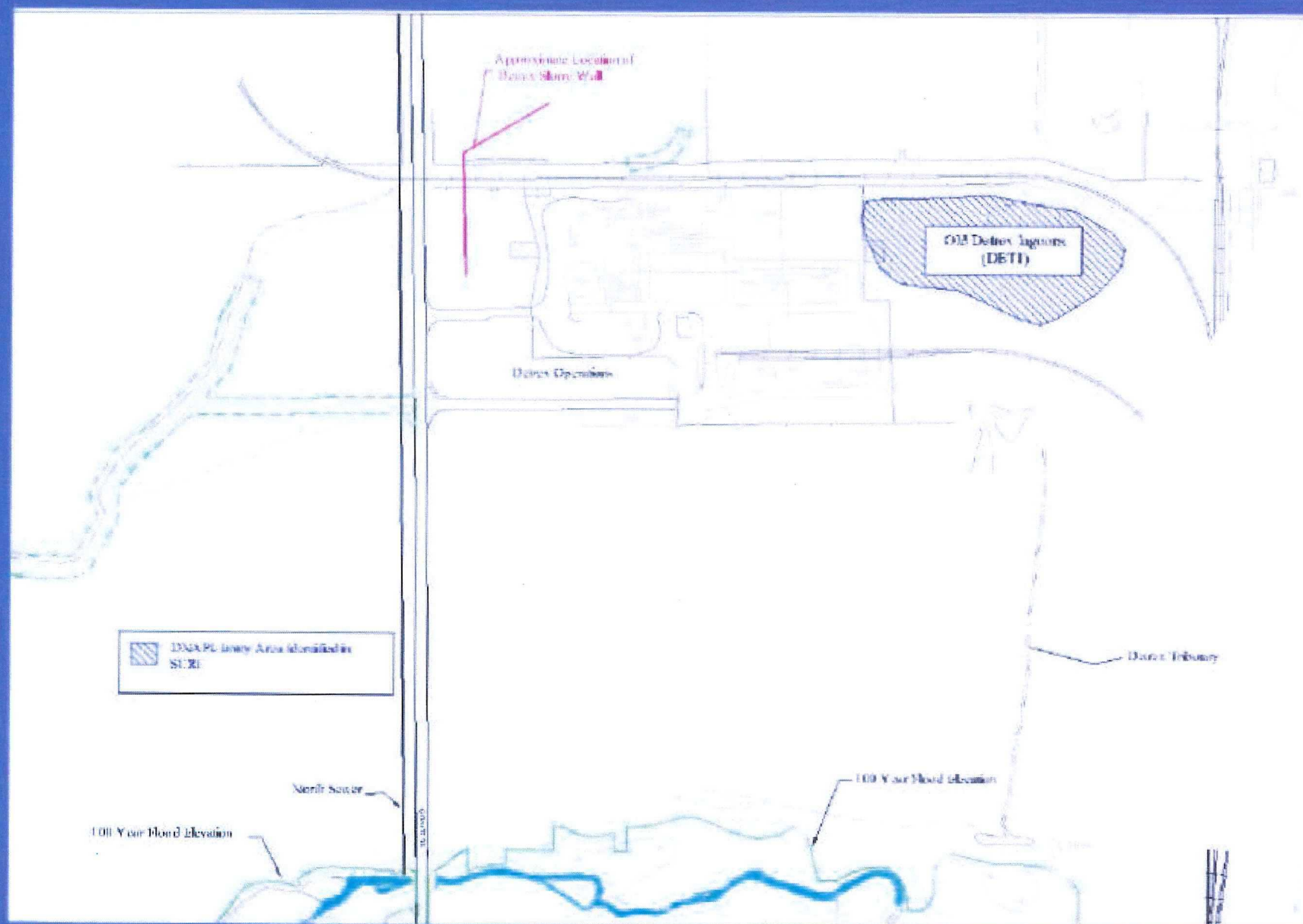
Attempts at Implementation of Source Control by Detrex

- 1997 Rod Requirements
 - Construct Slurry Wall (approx 1500 feet long)
 - Install 40 vacuum-enhanced extraction wells
- Between 2000 and 2002
 - Installed a slurry wall (approx. 450 feet long)
 - Installed 12 vacuum-enhanced extraction wells
(Only 3-4 Operate efficiently)
 - Extracted approx. 9700 gallons of DNAPL, water and sediment over the 3 years



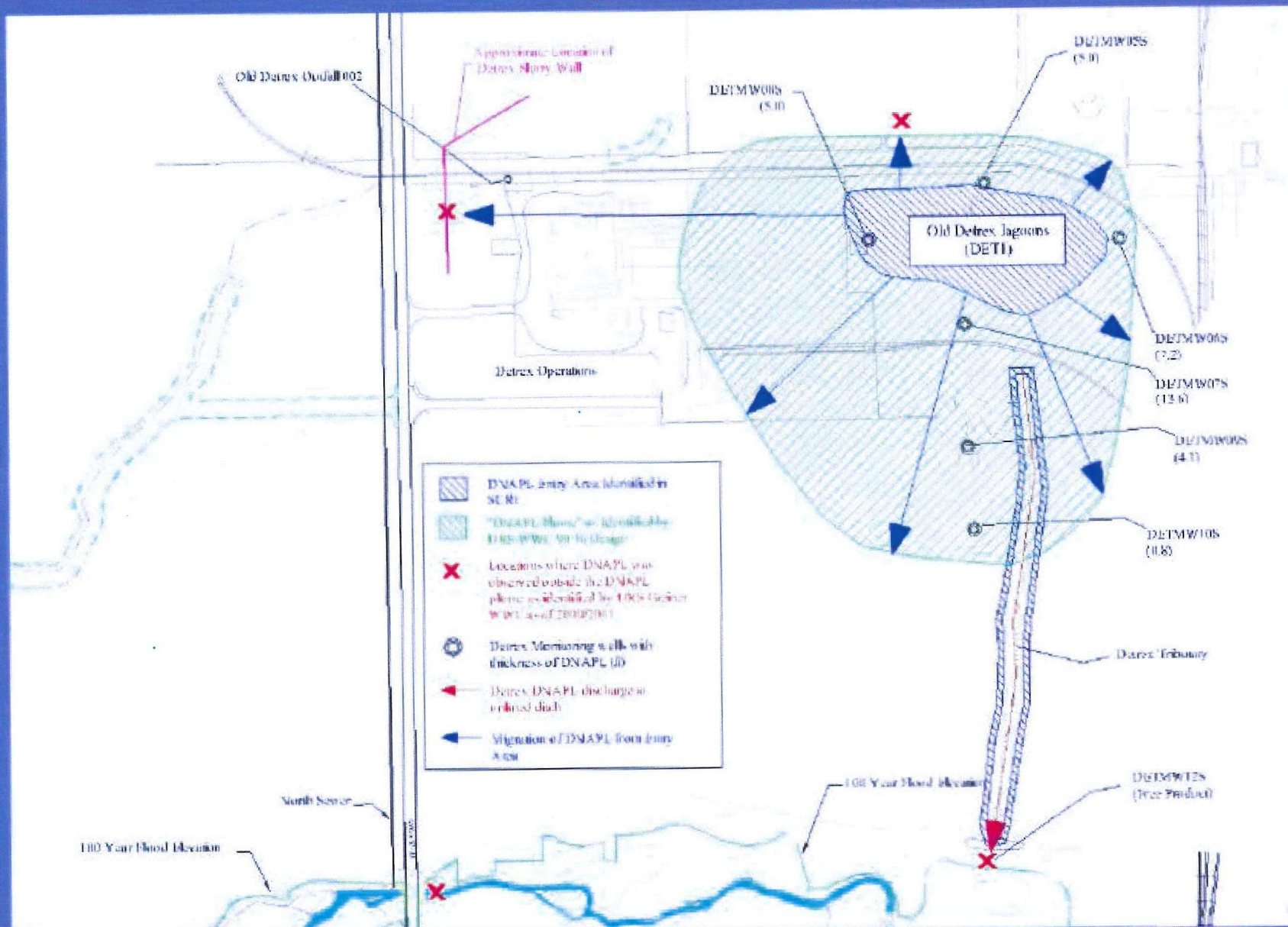
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Figure 4



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Figure 5A

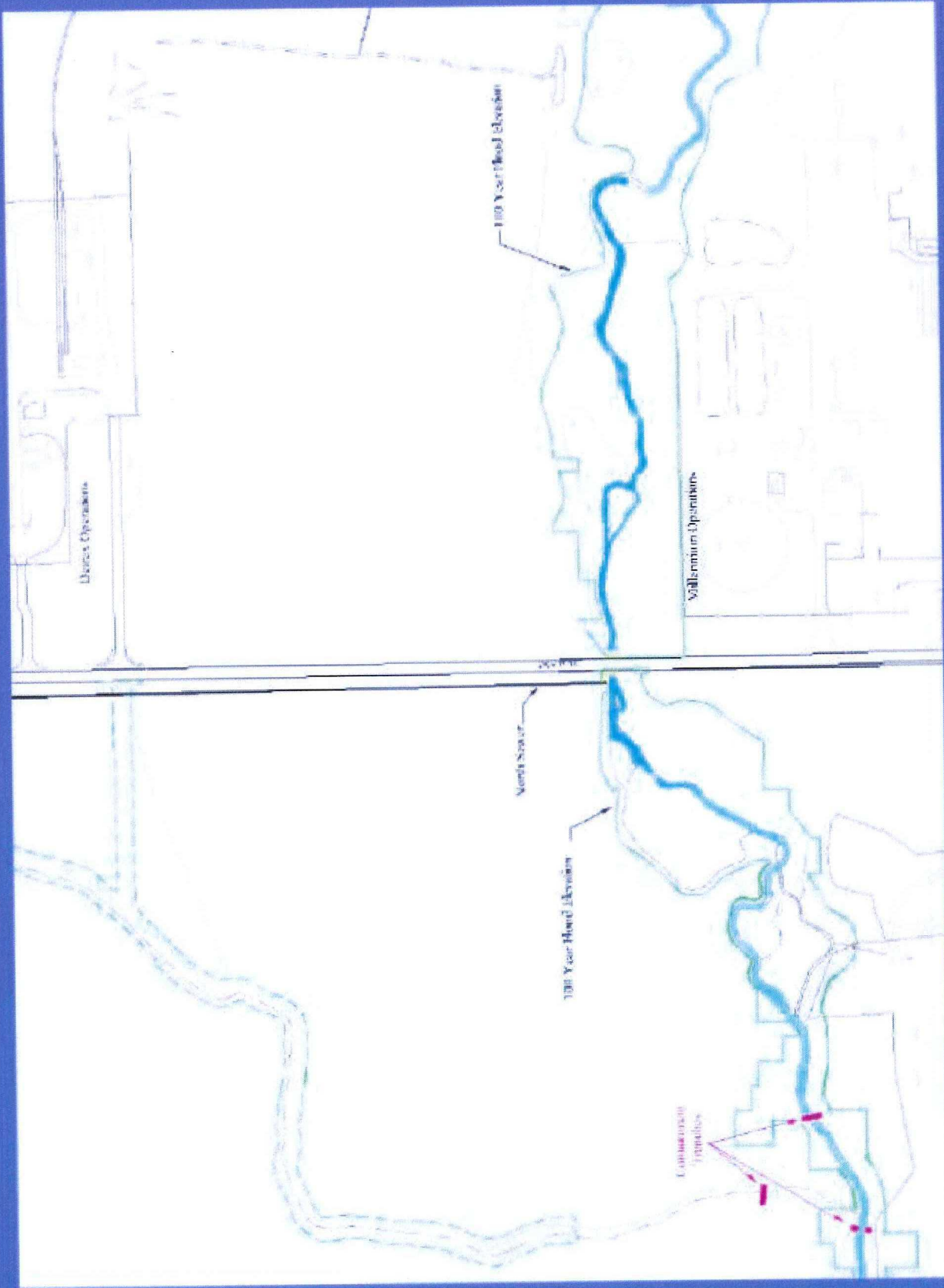


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Figure 5C

Containment of DNAPL Migration Along Fields Brook

- Three containment trenches were constructed in Fields Brook
- Two trenches for each potential pathway along Fields Brook
- Each containment trench was constructed so that any DNAPL migrating along Fields Brook would be contained and detected



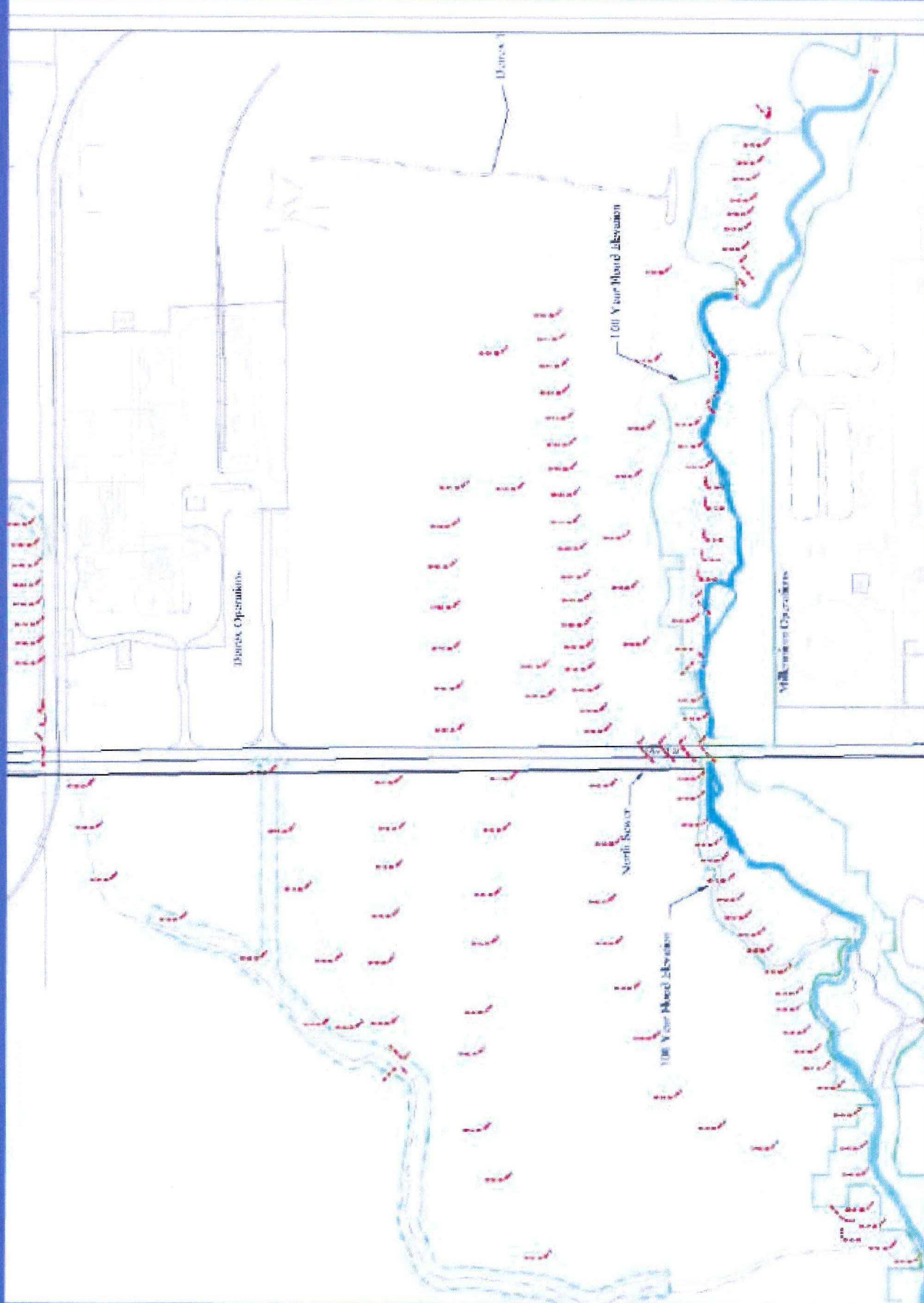
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Figure 6

Figure 7

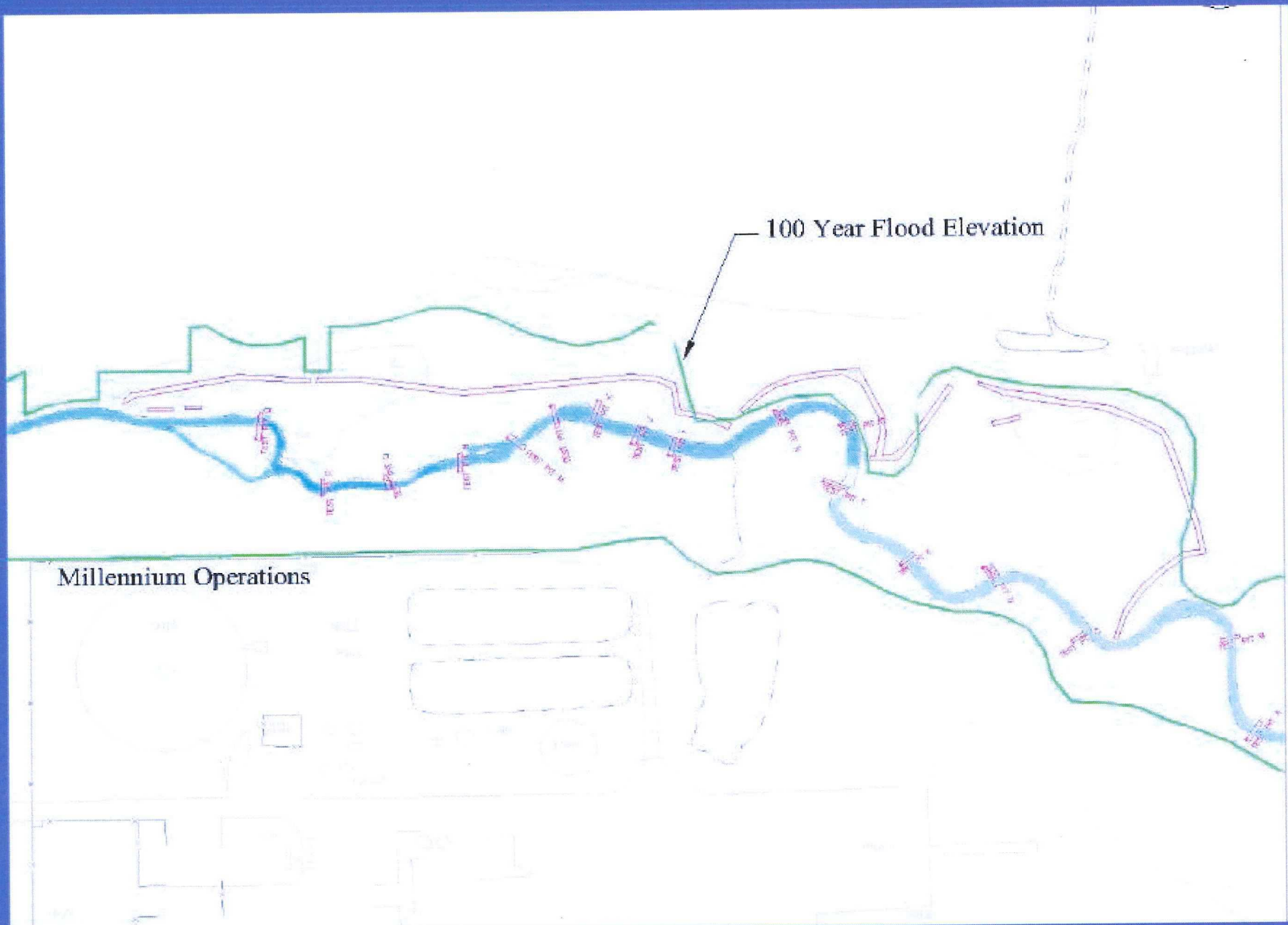
2005 DNAPL Identification and Delineation Study

- How this was accomplished
 - Approx 170 Geoprobe[®] borings
 - Headspace readings for all boring transitions from the overburden to Lacustrine clay
 - Trenching parrallel to and across Fields Brook
 - Dye testing



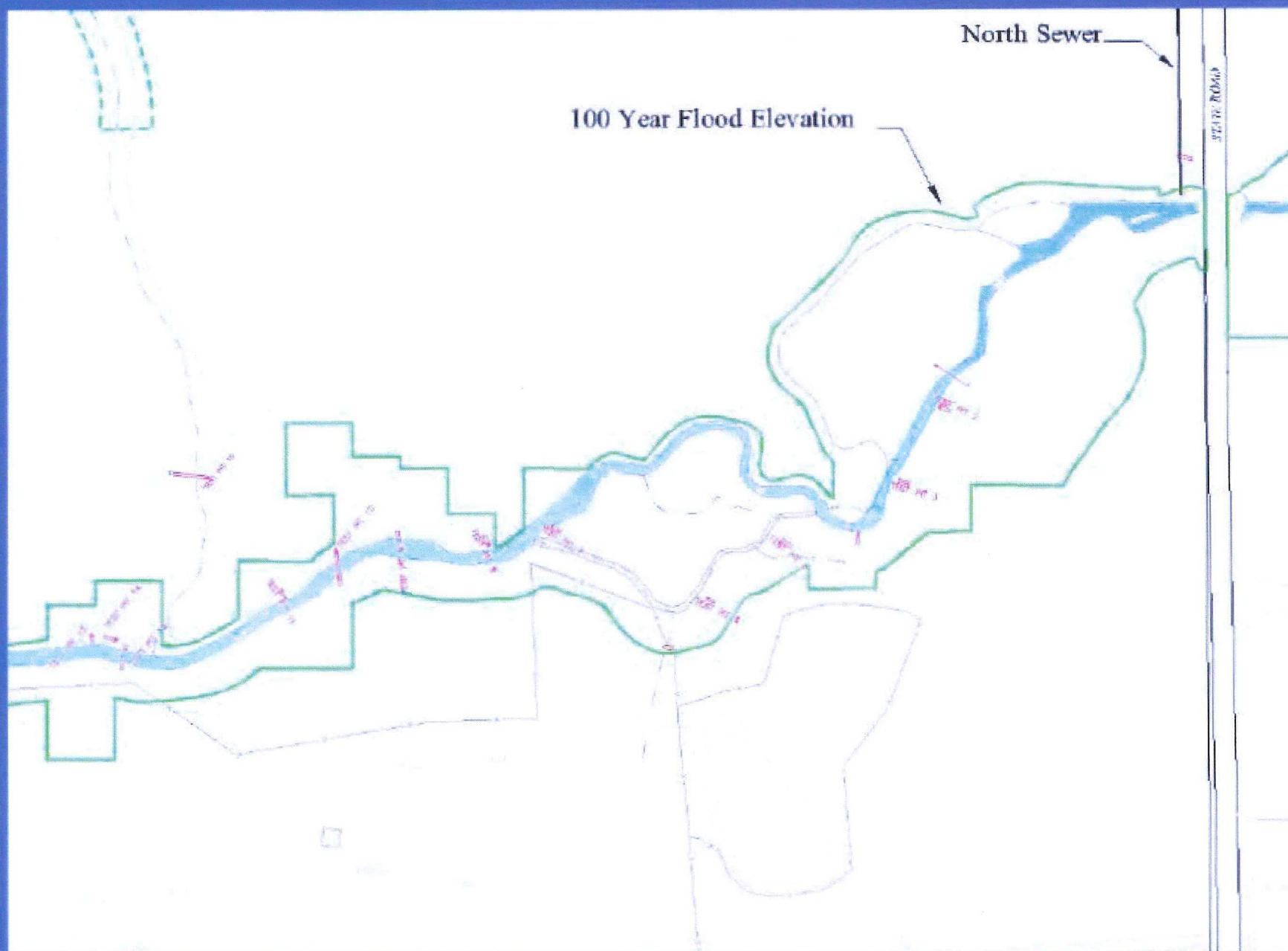
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Figure 8



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Figure 9A



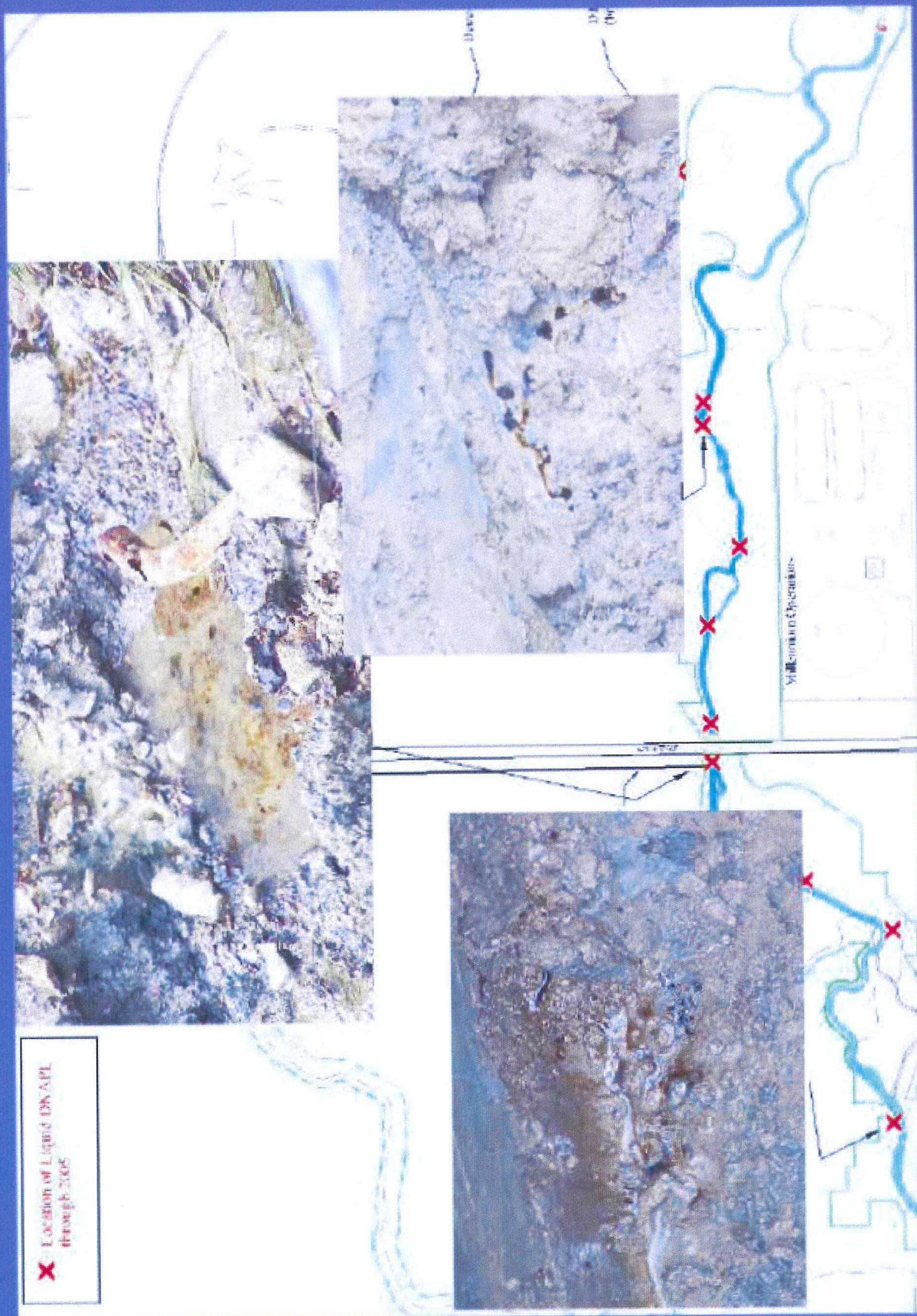
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Figure 9B

How do we know that DNAPL is present?

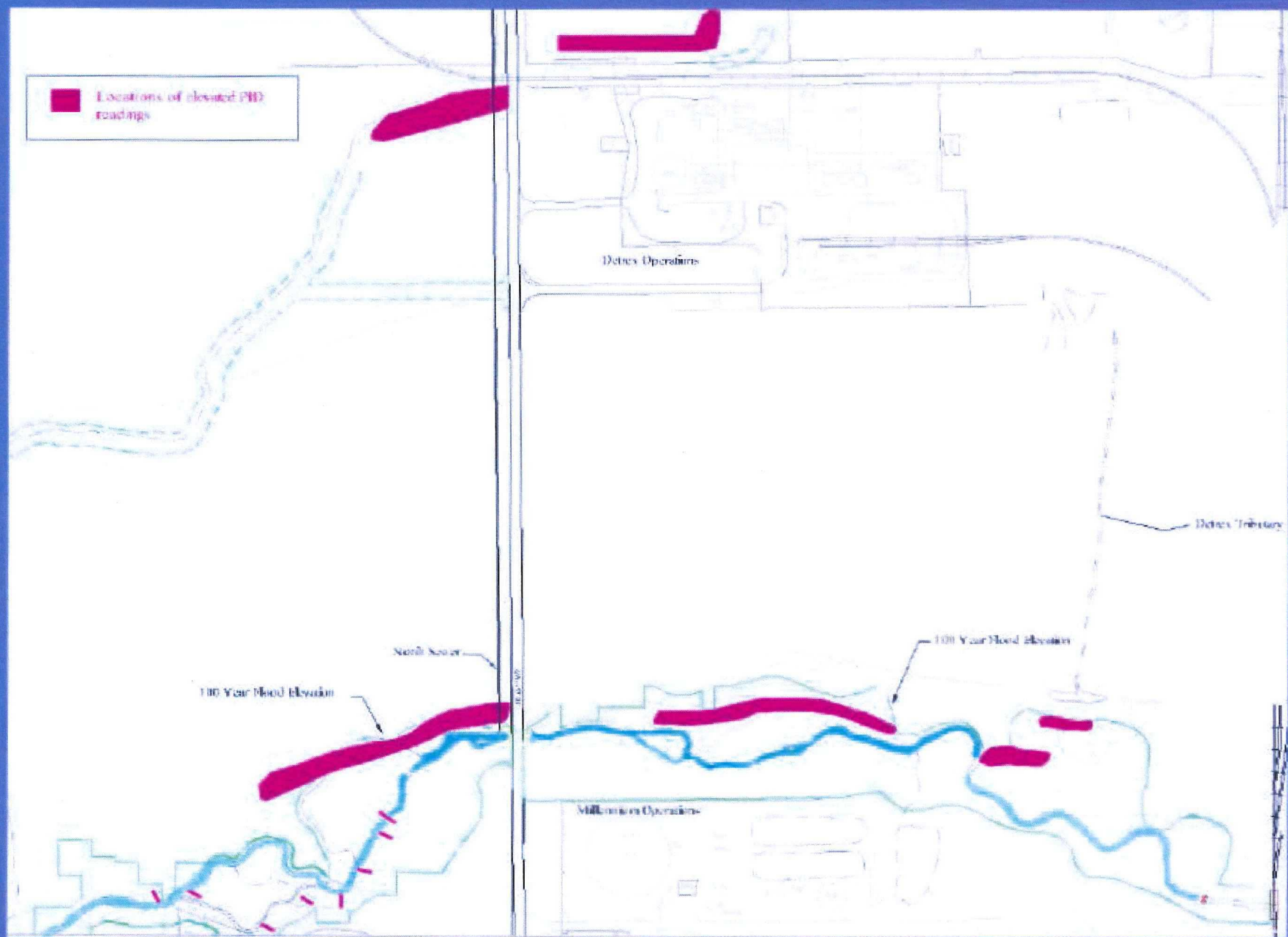
Two confirmation techniques:

- Visual Observations
- Elevated PID readings



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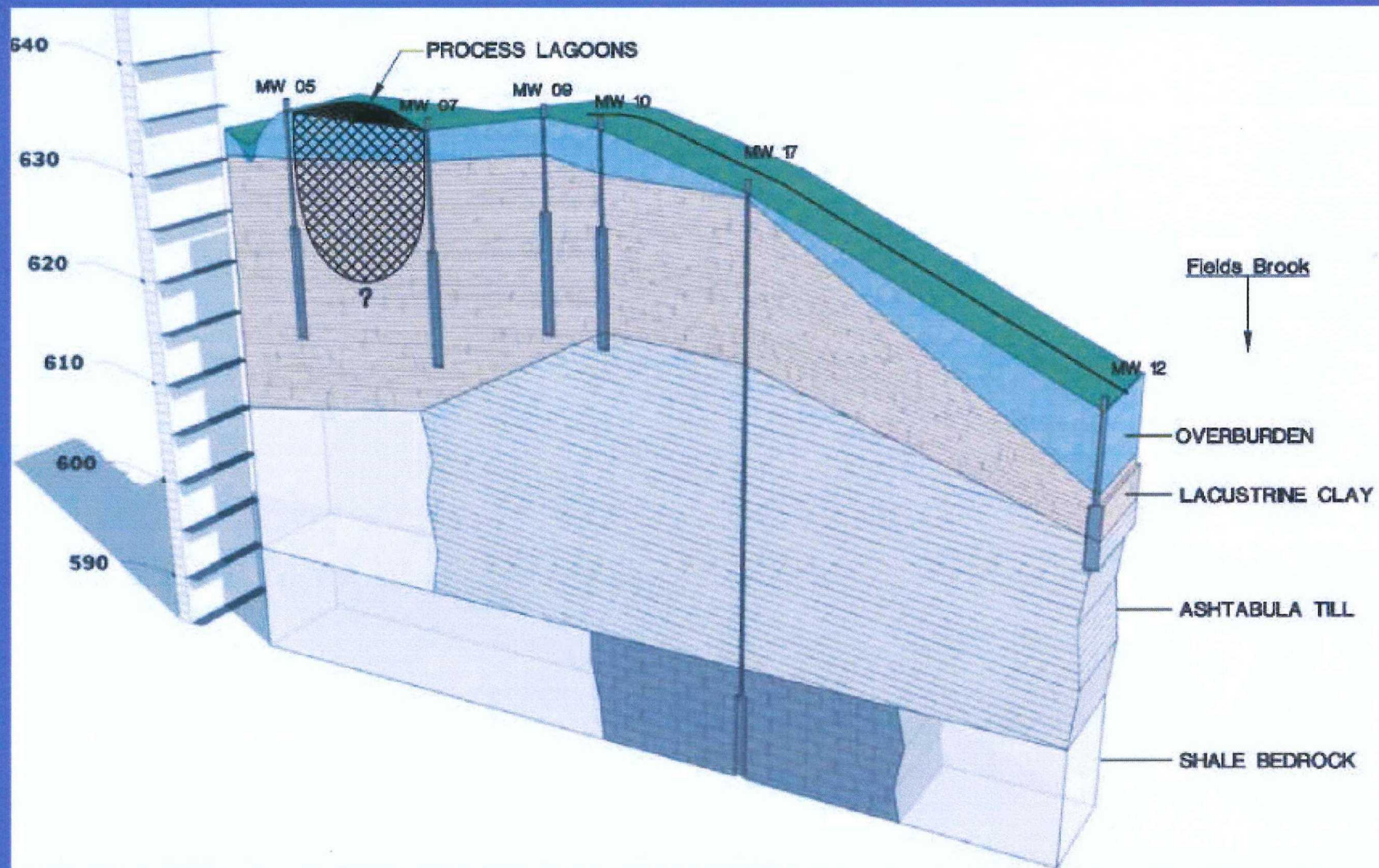
Figure 10



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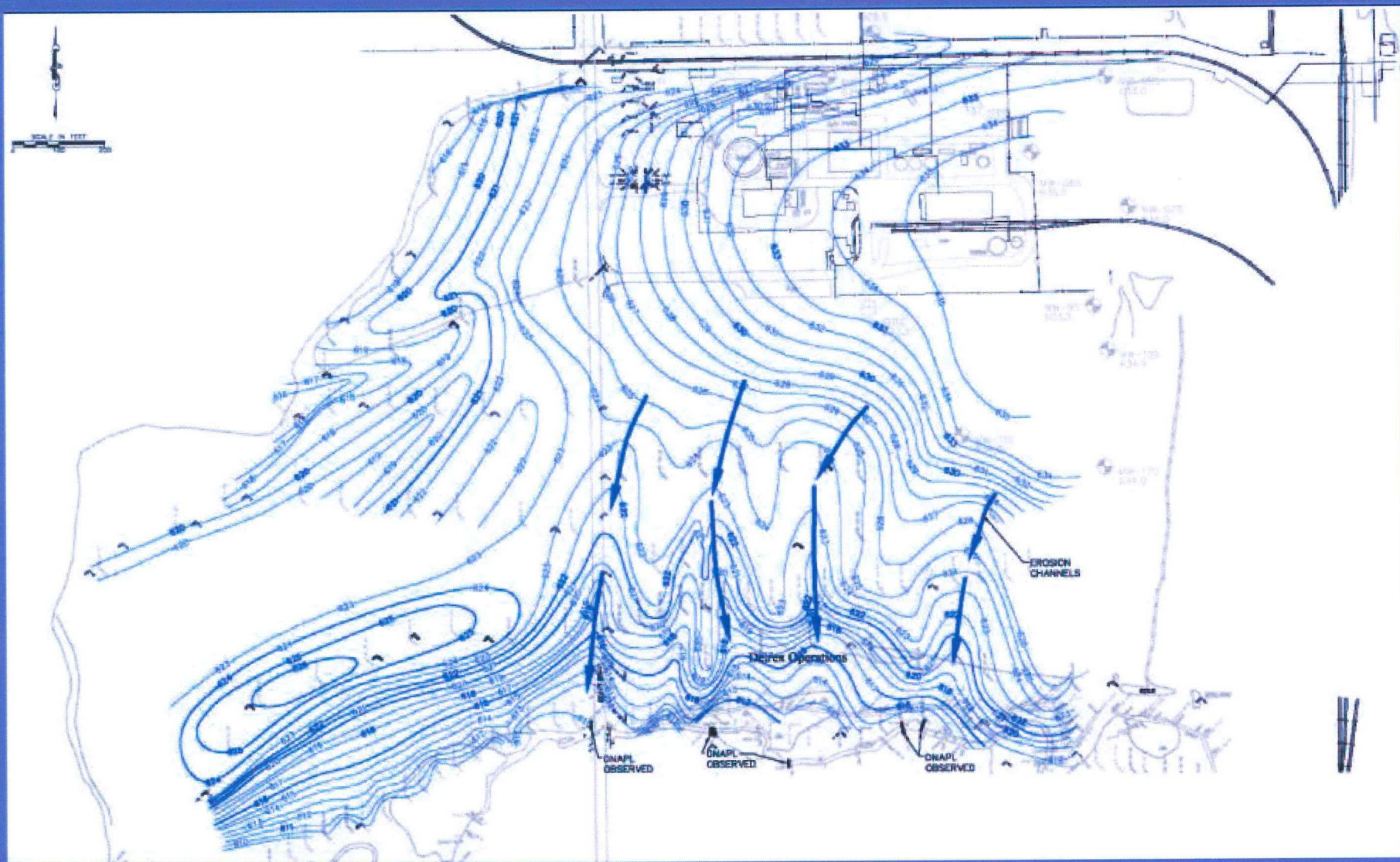
Figure 11

The Geologic Model



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Figure 12

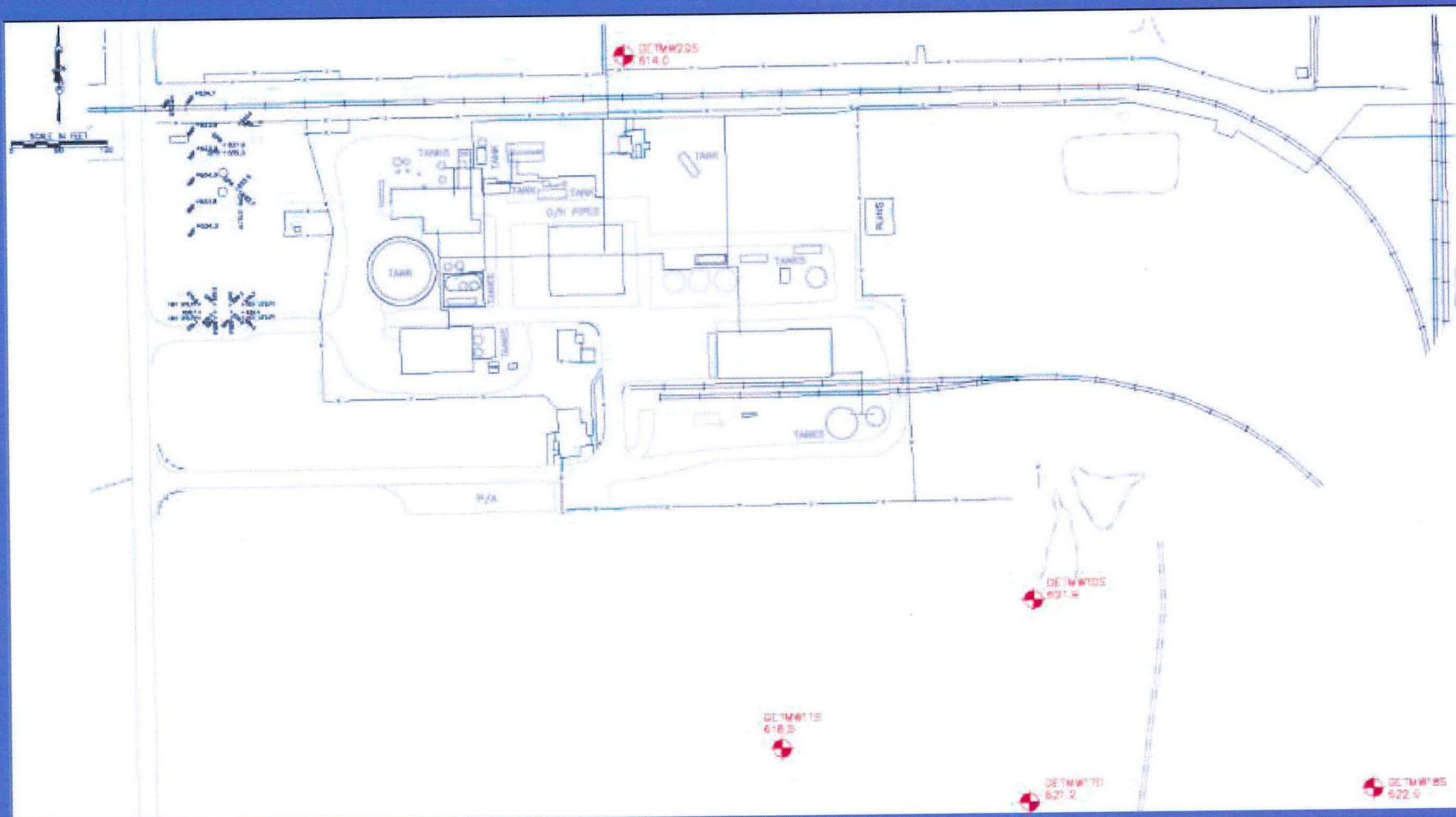


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Figure 13

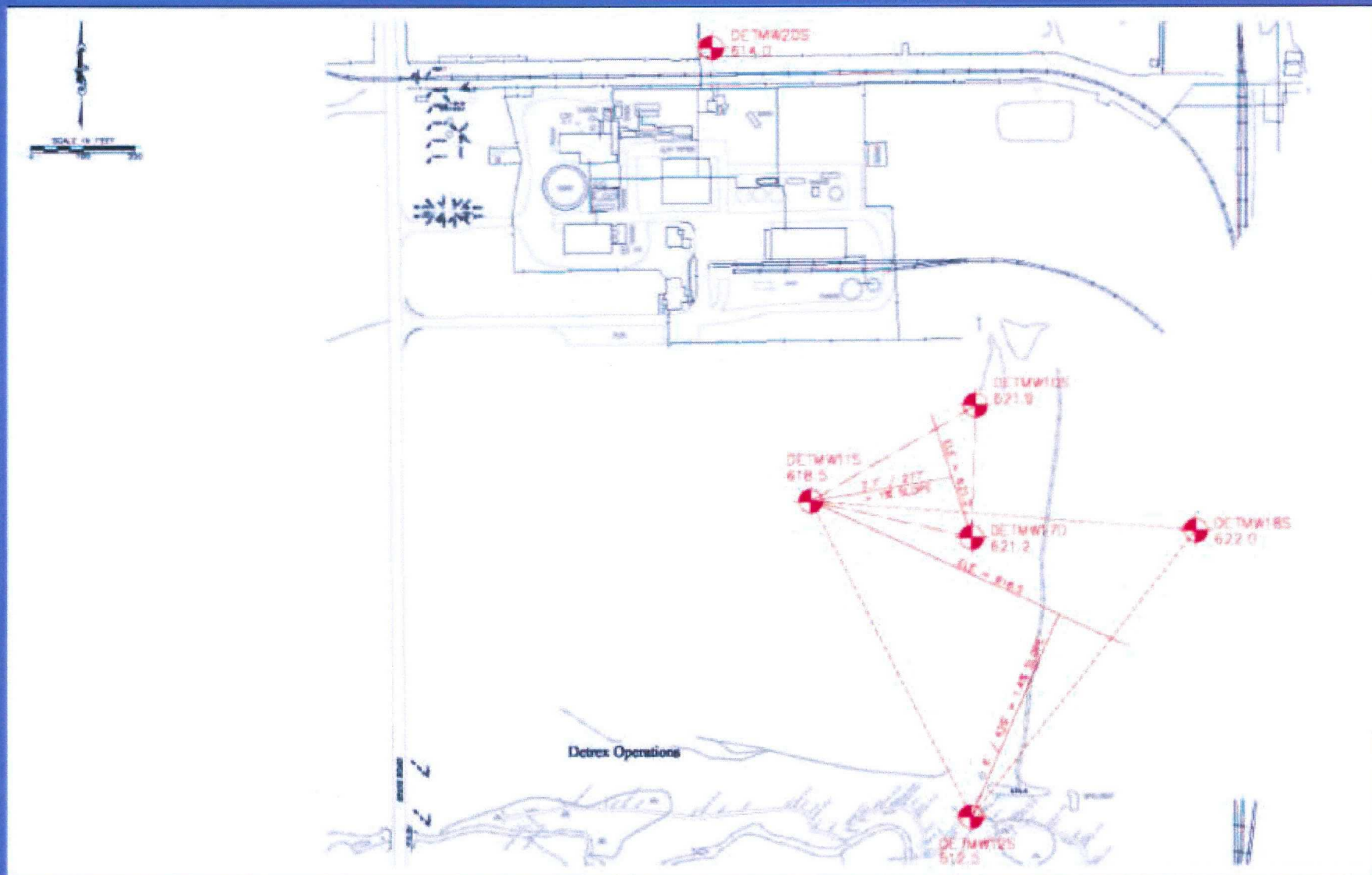
The Till Contour Map Generated by URS WWC is Incorrect

- Elevation data taken from the boring logs generated by WWC and used to map till were incorrect and caused an inaccurate conceptual model
- Source containment location and design relied upon this incorrect representation of the till



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Figure 15

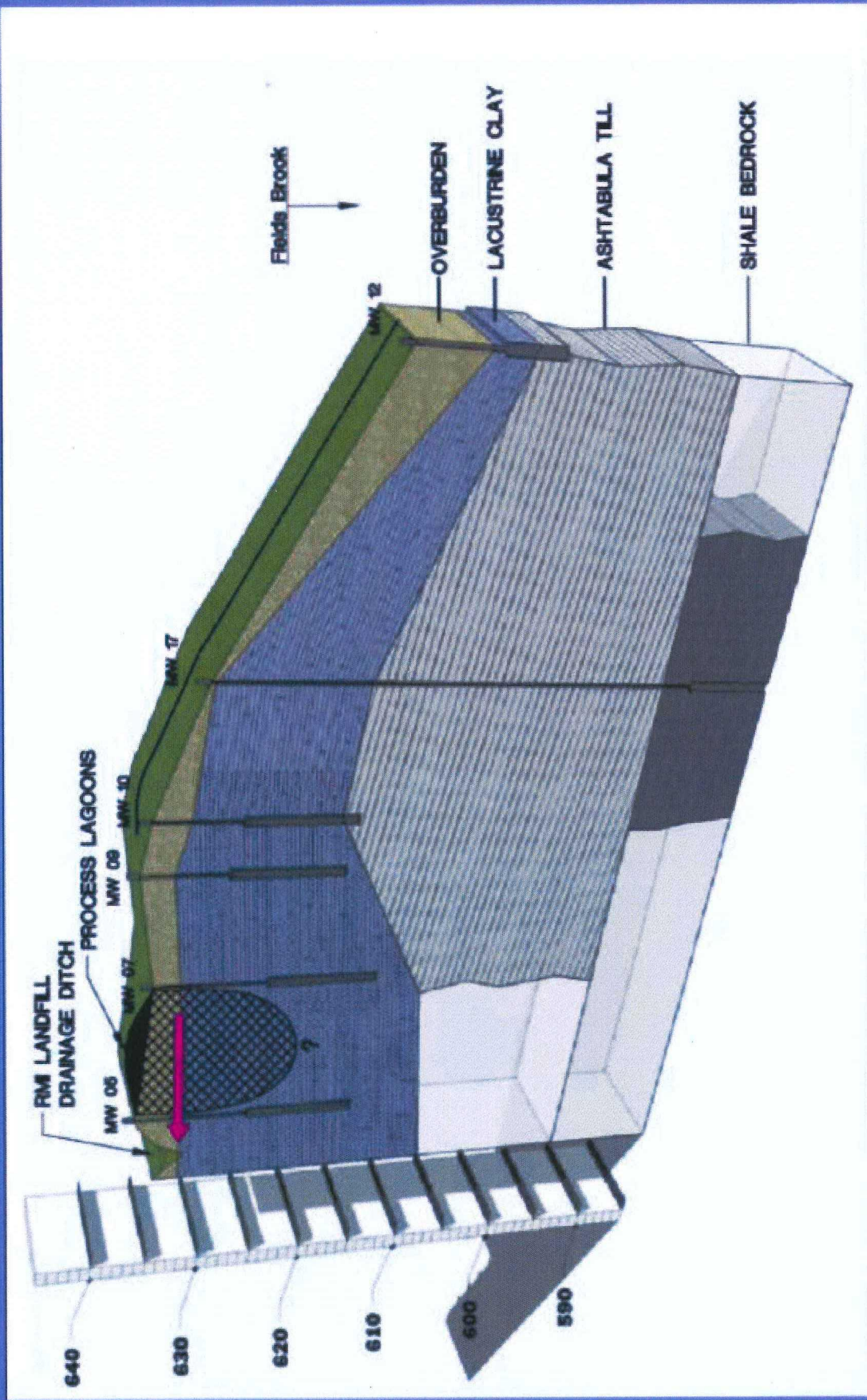


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Figure 16

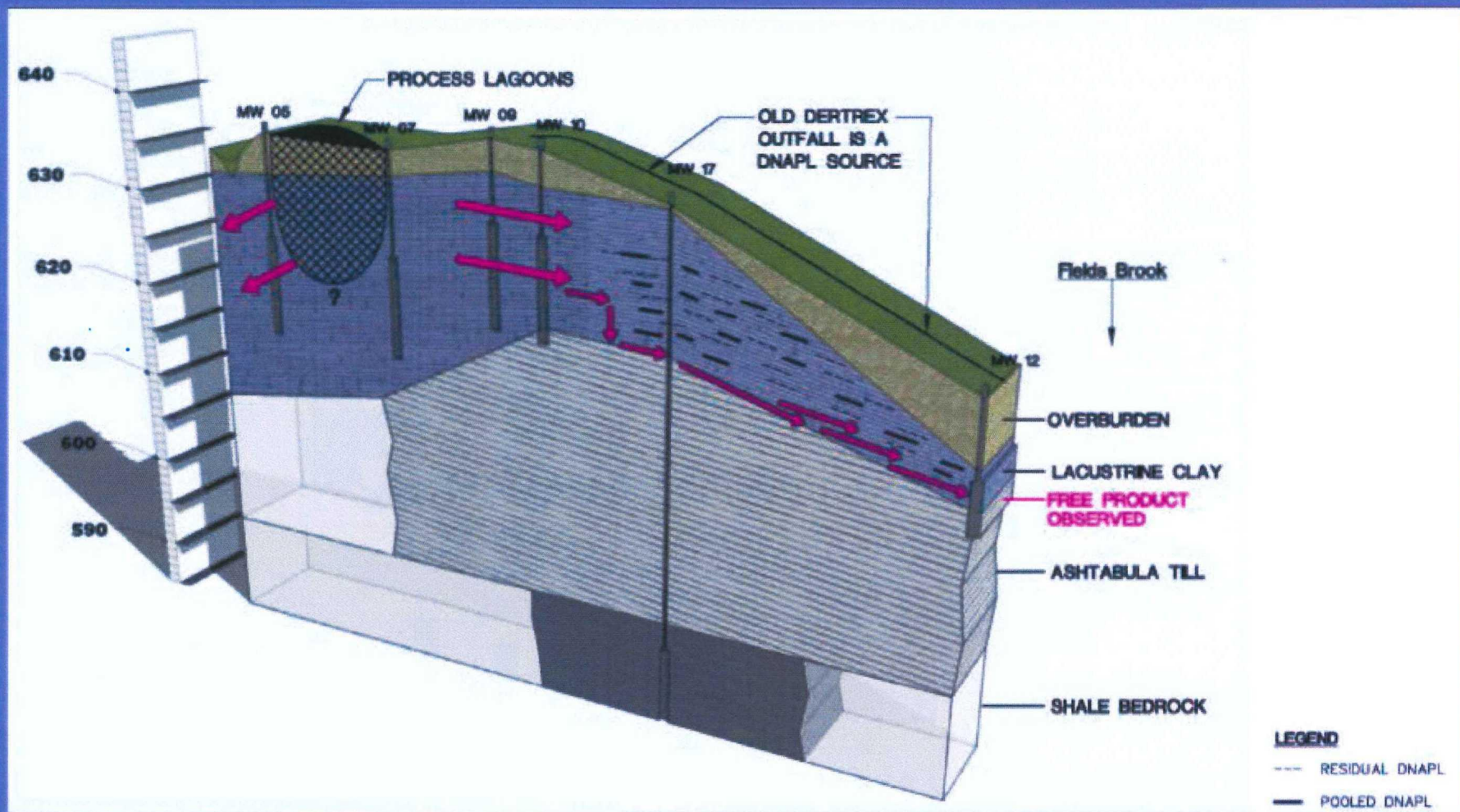
DNAPL Mitigation

- Migration of DNAPL can occur at multiple elevations in the lacustrine clay
- Migration of DNAPL can occur at the lacustrine clay and till interface



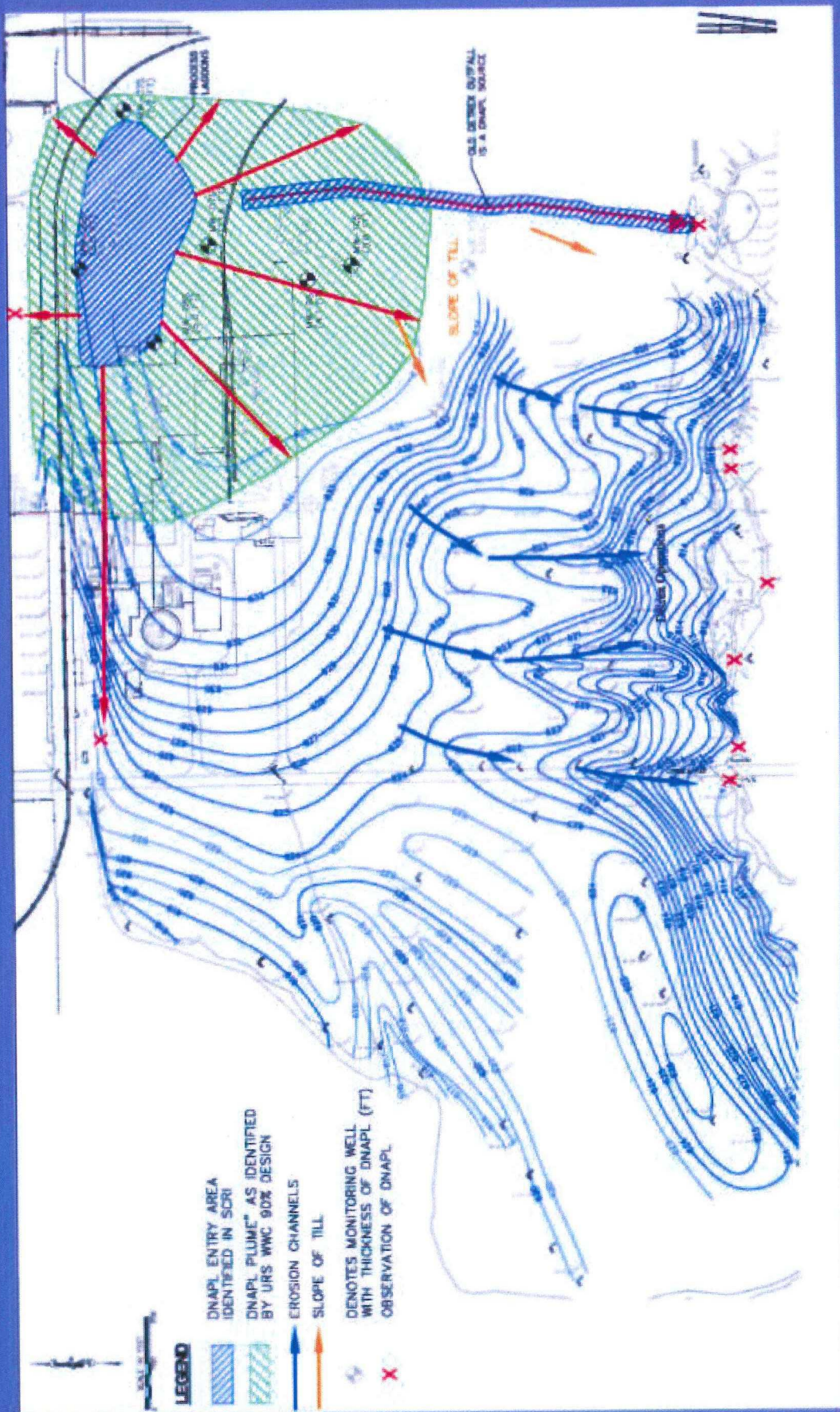
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Figure 17



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Figure 18



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Figure 19

Conclusions

- Substantial quantities of pooled/mobile DNAPL remain in the subsurface at the Detrex facility
- This DNAPL will continue to migrate until it reaches residual saturation
- This DNAPL moves through multiple levels in the formation(s)
- Pathways are widely dispersed and difficult to pinpoint
- Multiple pathways for DNAPL to travel from Detrex to Fields Brook have been identified
- DNAPL migration to Fields Brook, DS Tributary and other areas has not been mitigated or controlled by remedial actions undertaken at Detrex